

GR 98 P 2124 P

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Date: August 15, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Josef-Georg Bauer et al.  
Applic. No. : 09/761,240  
Filed : January 17, 2001  
Title : Power Semiconductor Element with an Emitter  
Region and a Stop Zone in Front of the  
Emitter Region  
Examiner : Johannes P. Mondt  
Group Art Unit : 2826

R E S P O N S E

Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

S i r :

Responsive to the non-final Office action dated April 17,  
2003, the following remarks are made:

Reconsideration and allowance of claims 1-4 are solicited.

Claims 1-4 remain in the application.

In item 1 on page 3 of the above-identified Office action, claims 1-4 have been rejected as being anticipated by *Stephani* (EP 0 760 528), which corresponds to US 6,455,911, under 35 U.S.C. § 102.

In order to expedite prosecution, Counsel - although a native German language speaker - will refer to the corresponding US application, US 6,455,911, instead of the German language reference *Stephani* (EP 0 760 528).

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and the claims have, therefore, not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 (similarly claim 4) calls for, inter alia:

A power semiconductor element, comprising:

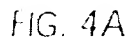
an emitter region;

**a stop zone in front of the emitter region** for preventing passage of an electric field to said emitter region at a reverse voltage;

In item 1 on pages 3-4 of the Office action, the Examiner stated that *Stephani et al.* "teach (cf. Figure 1) a power conductor element ... comprising: an emitter region 2; a stop zone 4 in front of the emitter region".

As stated in *THE BIPOLAR JUNCTION TRANSISTOR*, Addison-Wesley Publishing Company (1989), on page 3, "[t]he emitter and collector designation arise from the functions performed by these regions in the operation of the device". In the device shown in Fig. 4A and 4B, it is the "source region 51" which is the emitter, and not the "semiconductor region 2" as alleged by the Examiner. In *Stephani et al.* the reference sign 2 denotes a "semiconductor region 2" forming a "drift region" (col. 5, lines 32-33).

As can be seen from Fig. 4A (for example) of *Stephani et al.*, re-produced below:



(a), complete prevention is not possible and not disclosed; the verbiage "prevent passage" is thus to be interpreted as a notable reduction in the electric field, - in other words: a partial suppression, rather than a complete elimination thereof (see disclosure, page 10, "very effective", as opposed to completely effective). However, a notable reduction of the electric field is both intended (cf. column I of page 2, lines

28-53) and disclosed (cf. Figure 6-7) by Stephani et al (EP 0 750 528 P2).

On page 7, lines 14-17, the instant application states:

The part of the **stop zone** in the off voltage condition surrounded by the space charge region can on the other hand be **completely activated**, which therefore results in a very effective stop zone.

(Emphasis added)

On page 3, lines 11-14, the instant application states in regard to Fig. 2 of the drawings:

... the doping gradient 8 of the stop zone 6 assumes a gradient in the area of the space charge region which, seen from the n-basis 1, **rises steeply**, thereby **preventing a passage of the field to the p-emitter 5**,

(Emphasis added)

Accordingly, it is believed that there is sufficient support in the instant application for reciting the limitation "a stop zone in front of the emitter for preventing passage of an electric field to said emitter region at a reverse voltage". The Examiner is therefore requested to interpret "preventing passage" to mean what it states, namely: preventing passage of an electric field.

It is accordingly believed to be clear that Stephani does not show the features of claims 1 and 4. Claims 1 and 4 are,

therefore, believed to be patentable over the art and because claims 2-3 are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-4 are solicited.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of \$ 110.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

  
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